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Simulation Overview of High-Performance Beam-Driven FRCs S.A. DETTRICK, D.C. BARNES, Tri Alpha Energy, E. BELOVA, PPPL, F. CECCHERINI, D.P. FULTON, L. GALEOTTI, S. GUPTA, H.J. MONKHORST, Y. MOK, A. NECAS, M. ONOFRI, L.C. STEINHAUER, T. TAJIMA, Tri Alpha Energy, TAE TEAM — The C-2U experiment [1] presents a unique combination of challenges to simulation: a dynamic formation process, high beta ($\sim 85\%$ average) and large ion orbits, neutral beam heating and energetic particles, coupling of core transport with the SOL, and electrode biasing of the SOL. These challenges have been addressed with a suite of codes, including extended MHD simulation of dynamic theta-pinch formation, translation, and collision; Monte Carlo simulation of Neutral Beam heating; 3D hybrid PIC code simulation of the influence of neutral beams and end-biasing on macrostability; 3D PIC simulation of turbulent transport; PIC simulation of beam driven plasma modes; hybrid fluid/particle transport simulation of heating, fueling, and current drive; kinetic simulation of parallel electron transport in the Scrape Off Layer; and neutral particle transport.
[1] M.W. Binderbauer et al., Phys. Plasmas 22, 056110 (2015).

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